

ROADWAY SAFETY

I. PROGRAM OVERVIEW

The Roadway Safety program focuses on the operating environment. Grant funds provide necessary equipment and facilities to aid in the identification and analysis of critical locations, the recommendation of traffic safety enhancements and the improvement of the traffic flow to ensure that responsible agencies have the technical expertise to perform necessary analyses. Roadway design, construction, and maintenance are not permissible under the Office of Traffic Safety (OTS) grant program.

OTS has continued the “Safety Through Construction and Maintenance Zones” training program. Utilizing this program, trainers are sent to locations throughout the state to provide two-day training sessions that instruct roadway maintenance and construction personnel on the latest methodology for enhancing the safety of workers and motorists in those areas receiving maintenance or which are under construction. The program is utilized extensively by many local agencies, public utility companies, and private firms. The Federal Highway Administration (FHWA) has specifically encouraged continuation of the program. Generally, this program is renewed every three years. The continuous turnover of highway construction and maintenance personnel assures a continuing need for this education program. Continuation of the program ensures that suitable training is available to enhance roadway safety through construction and maintenance zones.

A sound traffic-engineering program utilizes collision location data, an inventory of traffic control devices, data on the numbers and types of driving lanes, average and peak hour traffic volumes, and data on the direction of travel. In addition, a cogent traffic-engineering program should also include traffic circulation pattern information and data on adjacent land use. There should also be an ability to identify and analyze critical collision locations to establish reasonable speed limits (85th percentile), to coordinate and optimize signal timing, and to correlate all of the referenced data with the types and severity of collisions experienced. The engineer must perform analyses and recommend mitigation in the way of traffic controls, roadway design changes, alternative routes, and non-engineering (enforcement) improvements.

In some instances, increased tort liability actions are a motivating factor responsible for compelling agencies to improve their engineering analysis capabilities. Consequently, the nature of traffic engineering efforts must be proactive. In addition, complete traffic-engineering efforts must offer long-term mitigation to identified conditions.

II. ACTION PLANS

Traffic Control Device Inventory (TCDI)

This activity involves establishing a relational database for the storage and retrieval of various control device data elements. Agencies must perform a complete field inventory of existing signs, signals, pavement and curb markings and stripping as well as the condition of each. Depending upon the size and complexity of the street layout table, some inventories may exclude certain items, such as pavement and curb stripping, and may keep separate inventories for some items, such as signals.

Traffic Counts

This activity typically involves the purchase of several traffic counting devices and the development of a schedule for their periodic and regular deployment. Depending on the sophistication of the count devices and the agency, traffic counts may also include the incorporation and the development of traffic flow pattern charts to illustrate relative traffic volumes. Traffic counts should also include average daily traffic (ADT) and peak hour volume counts.

Identification and Surveillance

This process allows for the systematic identification and ranking of critical or high collision locations within the jurisdiction and for performing analyses to discover conditions that may be contributing to the high collision rates. Software applications frequently include the generation of collision diagrams with Primary Collision Factors (PCF) identified. Applications may also include such functions as traffic flow analyses, traffic circulation patterns, and the statistical correlation of conditions present at the time of the collisions e.g., weather, time of day etc. In more sophisticated systems, collision locations can be identified as mid-block or intersection.

Bicycle and Pedestrian Safety

In this activity, there is commonly one point of focus, either on bicycle safety or pedestrian safety. Bicycle safety typically involves analyzing bicycle collisions and bicycle travel patterns to determine the relative benefits of including bicycle lanes, special signage or the prohibition of bicycles from certain roadways. Pedestrian safety is most commonly associated with the development of "Recommended Route to School" maps or performing analyses to determine the probable benefits from the installation of signalized pedestrian crosswalks. Related to the latter, mitigation is the on-going evaluation of a recently developed device that enables pedestrians to alert motorists to their presence. The alert is achieved via in-pavement flashing LED lights. The California Traffic Control Device Committee (CTCDC) and the California Department of Transportation (Caltrans) has developed standards for these devices making them available to cities and counties in a non-experimental capacity throughout the state via OTS grant process.

Many engineering and enforcement agencies are still employing the use of manual collision and citation tracking systems or are forced to use unwieldy legacy data systems. Extracting meaningful data through either practice is an arduous and inefficient undertaking and the resulting data may be unreliable. For instance, jurisdictions that share a common boundary may find that crashes on the boundary roadways are undercounted (counted by the wrong agency) or double-counted (by multiple agencies). Either way, the data integrity is compromised. In addition, neither a manual system nor legacy system provides a viable and efficient means for communicating captured data on either an intra-agency or inter-agency level. This inability to share data results in the perpetuation of separate engineering and enforcement data systems in these jurisdictions. By developing modern open data systems that are usable by both traffic engineering and enforcement within a city and/or across jurisdictional lines i.e., county-to-county, OTS is providing an opportunity to enhance not only data sharing but overall communication and agency efficiency.

Geographical Information System (GIS)

These systems involve extensive use of sophisticated and powerful software and hardware. Most applications locate data (collisions, citations, signage) by a unique geographical identifier (geocoding), usually points of longitude and latitude and employ software such as AutoCAD or ArcView. GIS incorporates the use of a wide variety of data layers, many of developed layers may be unrelated to traffic (such as census tracts, tax parcels, sewer lines, etc.); typically GIS will employ the use of global positioning satellite (GPS) transceivers. GPS technology directs signals to low orbit global satellites where the signal is then triangulated to a unique (specific) location on the earth's surface. Depending on the complexity of the community, the local funds the agency is willing to commit and the proposed uses of the systems, GIS offers a flexible and appropriate solution for a variety of identified problems. OTS has assisted many jurisdictions throughout the state in implementing Geographic Information Systems applications. Numerous cities and counties throughout the state have implemented GIS in their jurisdiction and many more are in the process of implementing GIS programs for their agency.

During this fiscal year, OTS intends to initiate many more grants involving Geographic Information Systems. In a planned effort, OTS intends to automate manual processes and replace legacy data systems that are no longer efficient or effective. OTS intends to implement these systems on a county level and on a city level in the "wired" counties.

Training and Review

The Safety Through Construction and Maintenance Zones and the Engineering and Enforcement (E&E) Team programs are funded through the Institute for Transportation Studies (ITS) of the University of California, Berkeley. Both programs have received national recognition for their excellence.

With the advancements being made in data automation and the increased number of software packages related to traffic engineering and mapping, the scope of engineering in the OTS grant program has changed markedly from just a few years ago. As the concept of GIS matures, the line delineating traffic records and traffic engineering is rapidly blurring if not disappearing completely. Traffic record systems are becoming increasingly comprehensive, providing data storage and retrieval mechanisms that apply to both engineering and enforcement, as well as to other interested organizations. For this reason, many projects may appear to be traffic record projects when they are in fact, engineering projects. Since both disciplines may be using the same computerized database, the degree to which the project requires applied engineering fieldwork is used to distinguish between traffic records and traffic engineering.

To achieve the greatest potential for reducing fatalities and injuries, OTS recommends grantees consider the following countermeasures when preparing their project agreements (*Note: The OTS "Blueprint" contain additional recommended "best practice" countermeasures*):

- Promote regional Safety Management Systems (SMS) through local corridor safety projects.
- Encourage municipalities to explore and study modern traffic calming techniques and applications.

- Fund traffic-engineering projects that involve multi agency or multi municipality data sharing.
- Sponsor system concepts that support cooperative goals such as knowledge, resource, and data pooling.
- Promote system interconnectivity by funding telecommunications needs.
- Provide a working co-op-based system that will speed the paradigm shift of the traffic-engineering audience.
- Encourage the interdependence of traffic engineering activities amongst municipalities.
- Encourage the University of California, Berkeley, Institute of Transportation Studies to add Traffic Calming techniques to traffic engineering training classes.
- Train maintenance and construction workers in the “Safe Handling of Traffic through Construction and Maintenance Work Zones.”

III. TASKS

TASK 1 - PROGRAM DEVELOPMENT AND ADMINISTRATIVE COORDINATION

This task provides for the necessary staff time and expenses incurred by OTS that are directly related to the planning, development, coordination, monitoring, auditing, and evaluation of projects within this program area, and the preparation of the 2005 Highway Safety Plan. Funding is also provided in this task for the printing of brochures and pamphlets, distributing literature and media materials developed through successful projects, or obtained from other sources. Assistance is also provided under this task to individuals to attend and participate in technology transfer workshops, training sessions, or educational meetings or conferences.

TASK 2 - ELECTRONIC ENGINEERING DATA SYSTEMS

Projects funded in this task provide local agencies with the ability to collect, extract and manipulate traffic collision and citation data. Utilizing these high-powered data systems will enable these agencies to conduct thorough collision/citation analyses that will allow for statistically meaningful and technically accurate graphical representations. These systems will be used to track data throughout the locality to evaluate high collision/citation locations upon which to base mitigation efforts or other capital improvement decisions. In addition, these systems will also allow for information sharing between and amongst local jurisdictions along shared boundaries to effectively identify and classify collisions or other traffic related data by geographical reference points. Four grants will be continued into 2005, and five new grants will be initiated.

Project No.	Fund	Agency	Equipment	Federal Share FY 2005
RS0401	157	Belmont	N/A	\$42,600
RS0403	157	Carson	N/A	\$26,300
RS0414	157	Torrance	N/A	\$60,000
RS0509	402	Coachella Public Works	N/A	\$43,000
RS0511	402	Coronado	N/A	\$52,750
RS0515	402	Elk Grove	2 Speed Display Signs 2 Lighted Crosswalk Systems	\$124,100
RS0516	402	Fresno County	N/A	\$42,427
RS0517	402	Los Angeles Department of Transportation	N/A	\$75,000

TASK 3 - ROADWAY IMPROVEMENT PROGRAM

Projects funded in this task enable local agencies to implement minor improvements in the roadways, as authorized by FHWA, including the installation of traffic count programs.

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RS0012 - CALIFORNIA DEPARTMENT OF TRANSPORTATION RUMBLE STRIP DEMONSTRATION PROGRAM

Initiated in fiscal year 2000, the project is continued into fiscal year 2005. This project will identify a list of roadway segments statewide that have the highest "run-off-road" collisions for each type of roadway facility i.e., freeway, expressway and conventional. Once the roadway segments are identified, the grantee will develop safety strategies to improve the roadway and thereby reduce "run-off-road" crashes in the identified locations. One of these solutions may be rumble strips. The overarching effort will be to develop a "strip" that is compatible with all roadway users including bicyclists. In addition, a public relations campaign will be initiated when the rumble strips are installed to highlight the purpose of the program. (\$800) (Q8)

RS0034 - CALIFORNIA DEPARTMENT OF TRANSPORTATION INDEPENDENT EVALUATION OF DISTRICT 10 CALTRANS AUTOMATED WARNING SYSTEM (CAWS) PROGRAM

Initiated in fiscal year 2000, the project is continued into fiscal year 2005. An independent evaluation will be conducted of the effectiveness of the Caltrans Automated Warning System in Caltrans District 10. As recommended by the Caltrans development team personnel, the primary focus of the study will be the determination of the impact of the system on driver behavior. (\$231,763) (Q8)

TASK 4 - TRAFFIC ENGINEERING EXPERTISE

Projects funded in this task enable agencies to better identify problems, suggest alternative solutions, and identify future needs by providing the traffic engineering expertise required. It also provides a professional engineer to the UC Berkeley Enforcement and Engineering Analysis Team, to conduct at least 35 annual administrative evaluations of local traffic engineering and enforcement programs. Funding for these projects is reflected in program area PT, Task 4.

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PT0424 - UNIVERSITY OF CALIFORNIA, BERKELEY ENFORCEMENT AND ENGINEERING ANALYSIS TEAM PROJECT

Initiated in fiscal year 2004, the project is continued into fiscal year 2004. This project will provide technical expertise to execute local traffic engineering and enforcement analysis. The program will be active throughout the State of California. Evaluation visits will be made by teams of experts for the ITS' Tech Transfer Program. Written analyses documenting the findings and recommendations are provided to host governments. The project also supports the organization of an annual statewide workshop on safety topics of interest to both enforcement and engineering professionals to highlight best practices and encourage information sharing across communities and among disciplines. (Funding for this grant is shown in PTS.)

TASK 5 - EDUCATION AND TRAINING

Projects funded in this task provide training for enhanced roadway safety. Funds are also obligated for the training of persons responsible for collision investigation and analysis.

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RS0008 - CALIFORNIA DEPARTMENT OF TRANSPORTATION TRAFFIC SAFETY AUDIT PROJECT

Initiated in fiscal year 2000, the current project is continued into fiscal year 2005. Road Safety Audits is a program initiated by the Federal Highway Administration. The FHWA currently has fourteen states participating in its Road Safety Audits program. The program undertakes a formalized examination of an existing or future road or traffic project that interacts with road users. In this process independent, qualified examiners study a roadway and report on the collision potential and safety performance of the roadway. (\$0)

RS0417 - UNIVERSITY OF CALIFORNIA, BERKELEY SAFETY THROUGH MAINTENANCE AND CONSTRUCTION ZONES PROJECT

The project is continued into fiscal year 2005. This project will provide multiple two-day training sessions to promote Safety Through Maintenance and Construction Zones on California roads and highways. The training sessions are led by teams of experienced traffic engineers, and will be held throughout the state at the request of local agencies. Approximately, 30 workshops will be conducted annually. The target population includes government agencies and private companies who work in and around safety and construction zones. (\$241,419)

**RS0504 – CALIFORNIA DEPARTMENT OF TRANSPORTATION
HIGHWAY WORK ZONE SAFETY PUBLIC AWARENESS CAMPAIGN**

This new project is planned for fiscal year 2005. This project will expand on a pilot project for work zone safety public awareness campaign statewide for one year. The proposed campaign will build on the prior campaign by expanding into areas of California that were not covered in the pilot campaign. The Department will continue to survey the impact of the campaign on public awareness and will analyze existing work zone collision data to determine whether the campaign continues to be successful in reducing work zone collisions and whether a cost benefit analysis supports permanently continuing this campaign statewide. (\$1,818,712.00)

**RS0514 – DEPARTMENT OF MOTOR VEHICLES
TRAFFIC SAFETY EDUCATION PROJECT**

The project results will comply with the Americans with Disabilities Act of 1992 by updating and combining DMV's first two videos entitled "Rules of the Road" and "Safe Driving Practices." The new combined video will enhance driver competency by providing a current video resource to reach people who are illiterate or have reading or other learning disabilities. In addition, this tape will also be suitable for DMV applicants for whom English is their second language. (\$55,245.)

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**RS0521 – SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
COMMUNITY COALITIONS**

The State of California consistently leads the nation in pedestrian/trespasser fatalities and has ranked in the top five for grade crossing injuries and fatalities. This project effort will form a coalition consisting of the Southern California Regional Rail Authority (Metrolink), California Operation Lifesaver and other rail safety partners and will work to establish community coalitions in various cities and other communities. The project will develop multi-lingual educational materials that will be distributed to community partners to educate the public on rail safety in their community. (\$50,000.)

TASK 6 - EQUIPMENT

Projects funded in this task provide equipment for grantees to reduce the number of fatal and injury collisions in their jurisdiction. The hardware provided under this task tends to be specialized and designed to address an identified traffic safety issue in the jurisdiction. Including but not limited to speed trailers, speed feedback signs and changeable message signs.

Project No.	Fund	Agency	Property	Federal Share FY 2005
RS0416	157	Tuolumne County	N/A	\$0
RS0404	163	Fremont Public Works	Speed Feedback Signs	\$66,035
RS0407	163	Los Angeles-Public Works	Speed Feedback Signs	\$522,000
RS0410	163	Oakland-Public Works	N/A	\$0
RS0501	402	Alameda-Public Works	Speed Feedback Signs	\$53,000
RS0502	402	County of Alameda-Public Works	Speed Feedback Signs Radar Trailer with Changeable Message Sign	\$94,336
RS0503	402	Alturas PD	Radar Trailer	\$22,500
RS0505	402	Campbell-Public Works	Speed Feedback Signs	\$33,000
RS0507	402	Fontana-Public Works	Speed Feedback Signs	\$70,000
RS0510	402	Contra Costa Co-Public Works	Speed Feedback Signs	\$39,000
RS0512	402	County of Butte-Public Works	Radar Trailer with Changeable Message Sign	\$21,500
RS0513	402	Ventura County-Public Works	Speed Feedback Signs In-road Warning Lights	\$120,000
RS0518	402	Rancho Palos Verdes-Public Works	Speed Feedback Signs and Radar Trailer	\$30,000
RS0519	402	County of Santa Clara-Public Works	Speed Feedback Signs	\$129,663
RS0520	402	Sonora-Public Works	Portable Changeable Message Signs	\$81,500
RS0522	402	Stockton-Public Works	Speed Feedback Signs and Radar Trailer	\$111,602
RS0523	402	County of Tehama-Public Works	2 Changeable Message Sign Radar Trailers	\$41,500
RS0524	402	Ukiah-Public Works	Speed Feedback Signs	\$22,000

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RS0136 - CALIFORNIA PUBLIC UTILITIES COMMISSION

TEST IN-PAVEMENT FLASHING LED LIGHTS SYSTEM AT SIX HIGHWAY-RAILROAD CROSSINGS

Initiated in fiscal year 2001 the Test In-Pavement Flashing LED Lights System at Six Highway-Railroad Crossings" project is continued into fiscal year 2005. This project provides funds for the purchase of flashing lights to warn motorists of oncoming trains at two strategic railroad-crossing locations. The intent of this experimental safety project is to enhance public safety at highway-railroad crossings through implementation of innovative technology. This project seeks to determine any change in behavior among motorists approaching and passing through the crossing when the test devices are operational, and the cost benefit of utilizing psychological barriers at crossings as opposed to traditional gate-type alternatives. (\$46,000)

**RS0130 – CALIFORNIA DEPARTMENT OF TRANSPORTATION
SBD I-5 (DESERT) NON-RECURRENT DELAY REDUCTION**

Initiated in fiscal year 2001, the San Bernardino I-5 Non-Recurrent Delay Reduction project is continued into fiscal year 2005. The project reduces delays from traffic incidents during major holidays by deploying Maintenance/TMT drivers to rove through the designated area. This roving will enable faster response and removal of incidents. The roving crews deploy ten Portable Changeable Message Signs (PCMS) to notify drivers of delays, safety messages, and incident messages. (\$101,103)

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**RS0526 – YOLO COUNTY
FLASHING BEACON PROJECT**

Under the Flashing Beacon Project, Yolo County will install these devices at the four intersections with the highest collision rates. The installation of the flashing beacons is an effort to attract the driver's attention to dangerous intersections, persuade drivers to stop, increase their awareness of cross traffic, and to reduce their speed for sharp curves. (\$94,400)

TASK 7 – EVALUATION

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**RS0525 - UNIVERSITY OF CALIFORNIA, BERKELEY
STATE LEVEL GEOCODING OF SWITRS DATA**

This project is undertaking to determine the most efficient methodology to accomplish state level geocoding of SWITRS data. To accomplish this effort, the UC Berkeley, Traffic Safety Center will conduct a national state-level survey of GIS applications to crash data; research current California county-level GIS survey methods; research current literature in order to create an inventory of possible precedents, procedures, syntax resources and base map sources for GIS compatible data collection and finally, recommend efficient and cost-effective methods that would allow California to provide state level geocoding of SWITRS data. (\$64,000.)

TASK 8 - INFRASTRUCTURE IMPROVEMENT

The Caltrans Highway Safety Improvement Program (HSIP) includes all projects in which the primary purpose is to reduce the number and severity of collisions on California highways. Projects may range from spot improvements such as new signal installations to statewide systematic improvements to Clean Up the Roadside Environment (CURE).

The Highway Safety Improvement Program's intent is to reduce the number and severity of collisions and their associated costs. In calendar year 2001, on the California State roadway system, there were 3,517 fatal collisions, 201,478 injury collisions, and 317,567 property damage only collisions reported.

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HAZARD ELIMINATION PROJECTS

The following narrative describes hazard elimination projects scheduled for continuation in 2005.

CONSTRUCT TRUCK DESCENDING LANE ON INTERSTATE 15 IN SAN BERNARDINO COUNTY

Initiated in fiscal year 2001, the "Construct Truck Descending Lane" project is continued into fiscal year 2005. The purpose of the project is to construct a southbound truck-descending lane. The project location is on Southbound Interstate 15 from 0.8 KM South of East Baker over crossing to 1.3 KM North of Halloran Summit over crossing in San Bernardino County. The project improvement is expected to alleviate southbound traffic congestion and safety concerns caused by a sustained downgrade exceeding two percent. Commercial vehicles make up a large percentage of the southbound traffic on this route as they move goods and services toward the Los Angeles basin. (\$0)

FFY 2005 164HE PROJECTS

Hazard Elimination Projects to be funded in FFY 2005 with Section 164 funds will consist of a variety of activities and individual projects based upon approved task orders in accordance with the provisions of Section 164 funding guidelines. (\$26,753,970)

**FISCAL YEAR 2005 PROGRAM FUNDING
(ROADWAY SAFETY PROGRAMS)**

Task	Title		Major Cost Items					
1	Program Development and Administrative Coordination		Personnel and Operating Expenses					
2	Electronic Engineering Data Systems		Computer Hardware and Software, Contractual Services					
3	Roadway Improvement Program		Computer and Traffic Count Equipment					
4	Traffic Engineering Expertise		Personnel, Travel, Contractual Services, Operating Expenses					
5	Education and Training		Personnel, Travel, Operating Expenses, Contractual Services					

Program Code	Task No/ Agency	Funding Sources/Codes						Estimated Agency Contribution
		157	163	164	402	410	411	
RS	1 Local	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	State	\$0.00	\$0.00	\$0.00	\$85,226.00	\$0.00	\$0.00	\$0.00
RS	2 Local	\$0.00	\$0.00	\$0.00	\$337,277.00	\$0.00	\$0.00	\$0.00
	State	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
RS	3 Local	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	State	\$0.00	\$11,000.00	\$0.00	\$0.00	\$0.00	\$0.00	\$26,800.00
RS	4 Local	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	State	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
RS	5 Local	\$0.00	\$0.00	\$0.00	\$50,000.00	\$0.00	\$0.00	\$0.00
	State	\$0.00	\$2,070,651.00	\$0.00	\$0.00	\$0.00	\$0.00	\$29,534.00

**FISCAL YEAR 2005 PROGRAM FUNDING
(ROADWAY SAFETY PROGRAMS)**

Task	Title		Major Cost Items					
6	Equipment		Air Velocity Deer Whistles, In-Pavement Lighting Sys.					
7	Infrastructure Improvement		Contractual Services					
Program Code	Task No/ Agency	Funding Sources/Codes						Estimated Agency Contribution
		157	163	164	402	410	411	
RS	6 Local	\$0.00	\$623,103.71	\$0.00	\$964,001.00	\$0.00	\$0.00	\$117,611.00
	State	\$46,000.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$10,000.00
RS	7 Local	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	State	\$0.00	\$0.00	\$0.00	\$64,000.00	\$0.00	\$0.00	\$0.00
PSP TOTALS								
LOCAL:		\$0.00	\$623,103.71	\$0.00	\$1,351,278.00	\$0.00	\$0.00	\$117,611.00
STATE:		\$46,000.00	\$2,081,651.00	\$0.00	\$149,226.00	\$0.00	\$0.00	\$66,334.00